a multi-band multi-frequency deployment due to the difference in cell coverage. This is illustrated by FIG. **4**, which is a graph illustrating LTE UE access distribution percentage (%). This shows same cell coverage **410**, which should be about a 33 percent UE access distribution for each of the high band, medium band and low band frequencies. Each set (high, medium, and low) of frequencies can be considered to be a band class, and each band class contains some range of frequencies. It is noted that field observations **420** show that the UE access distributions are skewed toward the lower frequencies and a corresponding band class, resulting in uneven load distribution.

[0039] Thus, the load balancing UEs at the time of transitioning to idle mode approach used in a multi-band multi-frequency deployment does not meet the objective of load balancing, as the UE access distribution does not reflect the factors provisioned by the operator. To overcome this, the following methods have been attempted.

[0040] Method 1. In this method, an operator artificially biases the operator-provisionable distribution factors in such a way that the desired distribution is achieved. In particular, in this method, a weighted round-robin scheme to select the target layer (e.g., frequency and corresponding cell) to which a UE shall be released with dedicated cell re-selection priority. The ratio of UEs for which the load balancing at the time of transitioning to idle mode is applied is controlled by operator-provisioned settings. The operator provisions the weighting factor used for each configured intra-LTE and inter-RAT cell re-selection target. At the time of sending RRC: RRC Connection Release message to the UE, the serving cell determines based on operator-provisioned factors which overlaying layer should be given the highest priority. The target layer selection is based on the weights and the round robin scheme, thus the operator can distribute UEs in a geographical area across the overlaying layers.

[0041] For example, in a typical operator scenario with a low and high band LTE deployment with equal bandwidth and capacity, the operator desires to achieve a 50:50 distribution across the layers. But, due to unequal coverage between high and low bands, the distribution factors have to be provisioned such that higher factor of UEs are sent from low band to high band. This increases the number of UEs on the high band, decreases the utilization of low band and increases the utilization on the high band to match the utilization of the low band. In this approach, the biased weighting factor is applied to all UEs in the low band. This adversely impacts the UEs on the lower band, where there is no overlaying high band coverage. In the areas where the higher frequency band coverage is not available, the UEs fail to access the higher band and re-acquire the lower band. This adversely affects the battery life of the UE (estimated at about 6-10 percent) due to unproductive inter-frequency cell reselections. Further, during the reselection window, the UE is unavailable for data traffic.

[0042] FIG. **5** is a graph illustrating UE access distance **250** comparisons across overlying bands and is based on data from commercial deployment. In this deployment, the intent is to distribute all UEs evenly across both the bands as part of load balancing UEs at the time of transitioning to idle mode functionality.

[0043] More particularly, the plots in FIG. **5** are UE access distance distribution on each band. The plot **510** refers to the distribution for a high band cell site and the plot **520** for a low band cell site, which overlay each other. Example, majority of all the UEs are accessing high band access at a distance less than 450 meters (m). Typically, the higher band site will have smaller cell coverage due to higher propagation losses on the higher bands as compared to a lower band site. The plots show that about 95 percent of the UEs which access high band sites are within 400 m, versus for low band site it is about 1000 m. The plot is taken from a commercial deployment where the operator is using a 50:50 distribution across the low band and the high band. Thus the graph reflects that until about 500 m almost all accesses are distributed evenly between the two bands, and the high band access tapers beyond that as the cell coverage fades. UEs beyond 500 m can access only the low band, as there is no coverage from the high band. Thus the UE accesses for low band are seen beyond 500 m.

[0044] Method 2). An alternative method is to perform inter-frequency measurement at the UE **110** to determine which cells are providing access at its location prior to determining the target carrier and corresponding cell for load balancing UEs at the time of transitioning to idle mode. The enhanced approach would be for the eNB to determine the layers which are available for the UE at the location of the UE. This can be achieved by performing the measurement of the overlaying inter-frequency layers before releasing the UE. Based on the UE measurement report, the eNB acts to send the UE to a target layer which is available at the UE location. If there is no overlaying frequency available, then the UE will stay in the serving carrier.

[0045] This approach leads to N+1 RRC messages (N is the number of overlying frequencies) to and from the UE before release. This approach can help in achieving the desired UE distribution, but it has the following possible disadvantages:

[0046] The UE battery life is impacted due to inter-frequency measurement performed before release; and

[0047] Additional RRC signaling messages impact the cell capacity and thus are not desired in a loaded condition.

[0048] So, solutions which address the above short comings are needed.

[0049] The examples herein propose examples of algorithms and devices for performing the algorithms to enhance the Method 1 load balancing UEs at the time of transitioning to idle mode solution. The enhancement in an example embodiment is based on the eNB **170** considering the following factors at the time of making a decision to release the UE:

[0050] 1) UE access distance **250** within the cell site. This can be derived, for instance, using UE Rx-Tx difference information and the Angle of Arrival (AoA) measurements available for the UE at the eNB. Other possible techniques for determining access distances are described below.

[0051] 2) Access coverage distances **240** of each of the overlying band classes. This can be based on an operator-provisioned data structure **600** as shown in Table 1 (see FIG. **6**A) and Table 2 (FIG. **6**B). FIG. **6**A is an example of a possible operator-provisioned data structure **600-1** and FIG. **6**B is an example of a possible SON-derived data structure **600-2** used for load balancing UEs at the time of transitioning to idle mode. The data structure **600** includes a number of cell IDs **610** (of which there are A-G of them and each of these correspond to a cell **220**), frequency bands **620**, EUTRAN frequencies **630**, and desired percentage (%) factors **640**. The desired percentage factors **640** column